OPERATING INSTRUCTIONS & PARTS MANUAL

ARC WELDER

Model 3Z564

FORM
5S2303

02553

0289/070
VP

READ INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THE DAYTON ARC WELDER. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE!

RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

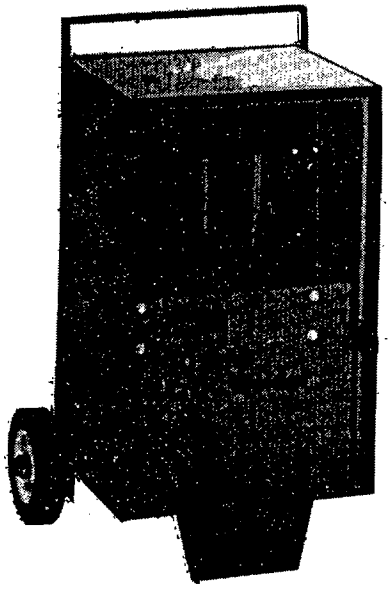


Figure 1

Description

The Dayton AC/DC arc welder is designed for use in industrial plants, metal fabrication shops and automotive repair shops. The welder is equipped with a welding cable, grounding cable, ground clamp, electrode holder and welding helmet. The welder has a forced-draft cooling system for component protection, and comes with a field wiring box for direct wiring connections.

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. Arc Welder, Model 3Z564, is warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined by Dayton to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specified legal rights which vary from state to state.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to, and shall not exceed, the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to illustrate and describe the product in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the product is merchantable, or fits a particular purpose, or that the product will necessarily conform to the illustrations or descriptions.

Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in "LIMITED WARRANTY" above is made or authorized by Dayton.

PRODUCT SUITABILITY. Many states and localities have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, please review the product application, and national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some states do not allow limitations on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of Limited Warranty, any implied warranties of merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective with limited warranty, first write or call dealer from who product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date and number of dealer's notice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier.If product was damaged in transit to you, file claim with carriers.

Manufactured For Dayton Electric Mfg. Co.,
5959 W. Howard St., Chicago, IL 60648

Specifications

WELDING CURRENT RANGES (AMPS)		RATED CURRENT OUTPUT 20% DUTY CYCLE		MAX. OPEN CIRCUIT	RATED INPUT @ RATED LOAD 60 Hz AMPERES		OVERALL DIMENSIONS			APPROXIMATE WEIGHT	
AC	DC	VOLTS	AMPS	VOLTS	80	208V	HEIGHT	WIDTH	DEPTH	NET	SHIPPING
30-250	30-250	30	250	78	76	230V	21"	13 1/2"	11 1/8"	134 lbs.	146 lbs.

General Safety Information

1. Before attempting to make primary or secondary connections, change parts or make repairs, be sure the welding machine is completely disconnected from the main power line. If a main disconnect switch or circuit breaker is used to disconnect power from welder, be sure to label the switch or breaker to prevent unexpected application power.
2. DON'T touch electrically "hot" parts. Never touch any exposed or non-insulated part of the cables, cable connectors, clamps, electrode holder, electrodes, or the power supply equipment to prevent harmful or fatal electric shock or burns.

WARNING: WEAR WELDING HELMET. A WELDING HELMET MUST BE USED FOR ALL WELDING OPERATIONS TO PROTECT YOUR EYES AND THE EYES OF OBSERVERS FROM PERMANENT DAMAGE (REQUIRES #10 FILTER).

3. Dress properly with flame resistant clothing. Protect all areas of the body from arc burns.
4. Do not use gloves or other clothing that contains oil or grease.
5. Protect yourself and others from flying objects.

WARNING: MAKE SURE YOUR OWN EYES, AND THE EYES OF OTHERS ARE PROTECTED WHEN CHIPPING SLAG, ETC.

PROTECT OTHERS WITH A SCREEN AND YOURSELF WITH A PROTECTIVE EYE AND FACE SHIELD. FLYING SPARKS ARE A DANGER TO YOUR EYES! ARC RAYS CAN ALSO CAUSE PAINFUL EYE BURNS.

6. Never pick up hot objects. Never pick up pieces of metal which have just been welded or heated, or the stub ends of electrodes which have been discarded.
7. Weld in an open area. If welding must be done in a confined area, provide and adequate exhaust fan system and ventilation.
8. Suitable spark shields must be used around welding equipment in flash welding.
9. Be sure the welding area has a good safe floor, one that is nonconductive electrically and noncombustable. Concrete or masonary is recommended.
10. Keep all combustible or flammable material at a safe distance (35 feet min.)
11. Keep a fire extinguisher handy at all times (Type ABC).

WARNING. AVOID DAMP AREAS AND KEEP THE HANDS AND CLOTHING DRY AT ALL TIMES. DAMPNESS ON THE BODY MAY CONDUCT AN ELECTRIC SHOCK.

12. Always be sure your machine is properly grounded.
13. To avoid shocks, shut off and unplug the welding machine before making repairs or internal adjustments.
14. Follow instructions on operating switches or making other adjustments. For more information see ANSI Z87.1.
15. Keep uninsulated portion of electrode holder from touching welding ground when the current is on.
16. Keep welding cable dry and free from oil and grease. Uncoil cables to remove loops and tangles.
17. Never use welding cables at currents in excess of their rated capacity. It will cause overheating and rapid deterioration of insulation.
18. Do not use worn or poorly connected cables. Do not overload cables.
19. Do not use electrode holder with defective jaws.
20. Do not use electrode holder with loose cable connections.
21. Keep the connections of the elecrode lead to the holder tight at all times.
22. Use only fully insulated electrode holders (and without protruding screwheads).
23. Never touch two electrode holders from separate welding machines at the same time.
24. When not in use, never place an electrode holder in contact with table top or other metal surface in contact with the welding ground. Provide an insulated hook or holder for electrode holder. A potential danger is that a holder in contact with the groud circuit provides a dead short circuit on the welding machine. If machine should be activated, this chort circuit would cause an excessive load on the machine and may damage insulation.
25. Do not leave an uninsulated electrode holder, or a "live" electrode on the table top or in contact with a grounded metal surface.
26. Do not operate the amperage adjustment under load. The amperage adjustment is provided for obtaining required current settings. Never adjust machine under the load of welding current The strong magnetic forces could make shunt jump causing welder damage or personal injury. Operate the amperage control only while the machine is idling, and the circuit is open.
27. Never strike an arc on a compressed gas cylinder or tanks that have contained cumbustible material.
28. Do not weld on hollow (cored) castings that have not been properly vented. The castings may explode.
29. Never weld in or near explosive atmospheres.
30. Do not weld without adequate ventilation.
31. When welding in confined spaces, provide ventilation in accordance with American National Standards Institute, Z-49.1 and consult NFPA No. 51.B. Never use compressed oxygen. The depletion of the oxygen supply, the heat of welding, and the fumes given off may cause severe discomfort or a serious illness.
32. When toxic fumes from lead or cadmium bearing materials or any other substance are present in harmful concentrations, always use an air supplied respirator.

General Safety Information (Continued)

33. Do not weld in the presence of even minute amounts of vapors from solvents, such as perchloroethylene of trichloroethylene. Ultraviolet light from the electric arc can decompose the vapors to form phosgene, a poisonous gas.
34. Do not weld near flammable or combustible material.
35. Keep combustibles at least 35 feet from the arc. If welding must be done in a particular area, move the combustibles away. If they cannot be moved, cover them completely with fire resistive screens. Cover cracks or openings in floors or walls, sweep floor free of combustibles and wet down.
36. Avoid welding on partition walls in contact with combustibles. Heated metal on the other side of partition wall being welded upon can ignite combustibles in contact with the partition.
37. Wear insulated shoe coverings when performing welding operations.
38. Be sure "ON-OFF" switch is in "OFF" position when unplugging or plugging in welding unit or when activating power source.
39. Observe the duty cycle of your machine. The rated duty cycle of a welding machine is the percentage of a ten (10) minute period that a welding machine can safely operate at a given output current setting.
40 For more information see ANSI Z87.1, ANSI A49.1, NFPA No. 51.B.

Assembly

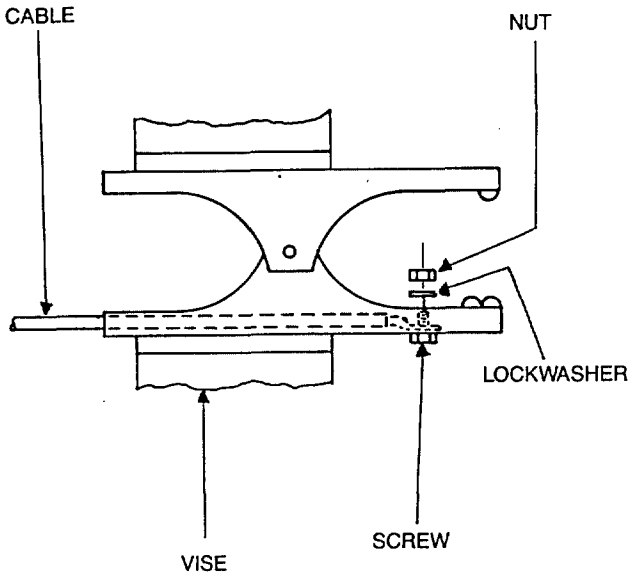


Figure 2 - Ground Clamp Assembly Less Cable

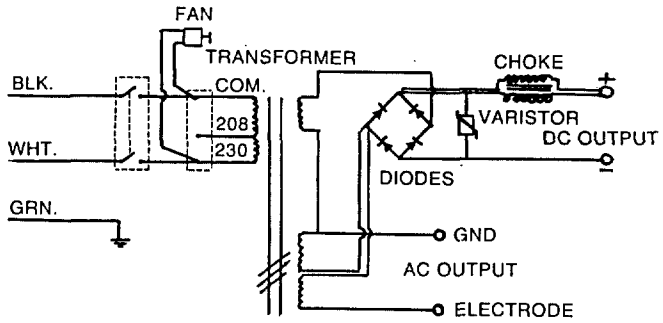


Figure 3 - Internal Wiring Diagram

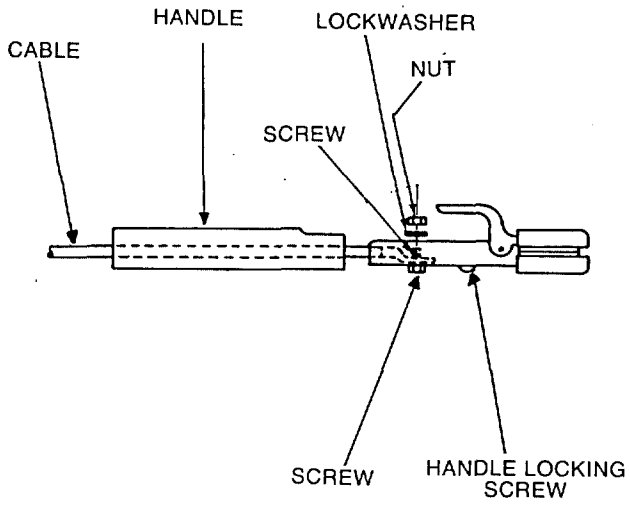


Figure 4 - Electrode Holder Assembly Less Cable

IMPORTANT: COMPARE LENGTHS OF THE TWO CABLES PROVIDED. THE SHORTER CABLE IS USED FOR THE GROUND CLAMP. THE LONGER CABLE IS USED FOR THE ELECTRODE HOLDER.

GROUND CLAMP

You will need a #2 Phillips screwdriver and 7/16" box end or similar type wrench.
See Figure 2 for reference.

1. Place ground clamp assembly in a vice and adjust vice so jaws are held open.
2. Insert cable into the double jaw side of the ground clamp assembly.
3. Insert screw through hole in ground clamp and cable lug.
4. Secure cable to the inside of the ground clamp assembly using screw, lockwasher and nut.

Assembly (Continued)

ELECTRODE HOLDER

See Figure 4 for reference.

1. Slide handle over cable with notched end of handle in direction of electrode holder.
2. Attach cable lug to holder by inserting screw through handle and cable lug.
3. Fasten handle to cable with screw, lockwasher and nut.
4. Slide handle over electrode holder, aligning hole in handle with Phillips head screw in electrode holder.
5. Insert Phillips head screw driver through hole in handle.
6. Turn locking screw counterclockwise until handle is securely in position.

WARNING: THE LOCKING SCREW MUST BE INSIDE OF HANDLE TUBE TO PREVENT ELECTRICAL SHOCK.

Installation

1. Locate welder in an area where exposure to dirt and dust is minimal.
2. Allow ample space around welder for maintenance or repair should it become necessary.
3. Position welder so that air vents located on side and back panels are free from any obstructions.

WIRING CONNECTIONS

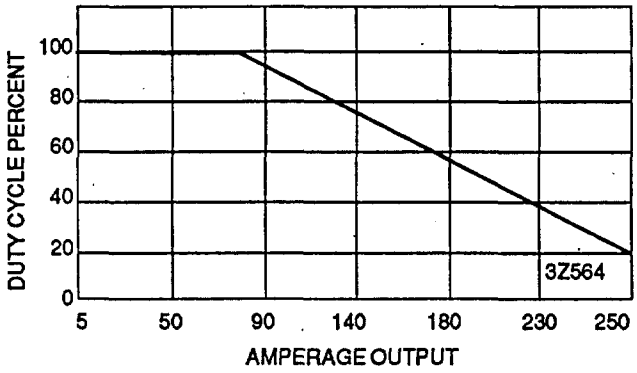
1. All wiring, wiring systems, and electrical connections must comply with the National Electrical Code (NEC), all electrical and safety codes and the Occupational Safety and Health Act (OSHA). In particular refer to Article 630, "Electric Welders" of the NEC.
2. Wire Model 3Z564 as follows:
   a. This AC/DC arc welding machine must be connected to a single phase 60 Hz., power supply rated either a 230 volt, or 208 volt. Consult the local power and light company, if there is any question about the system used locally, or the power connection, to connect the single phase power service to the welding machine.
   b. The welder should be field wired with a minimum wire size of #8 AWG to the nearest power supply (not over 25 feet.) Connections should be made to leads in the field wiring box at rear of welder. Check inside wiring box for proper wiring instructions.
   c. The welder frame must be securely and adequately grounded. This can be accomplished by wiring with a grounded metal conduit, or by using a separate ground wire connected to the green grounding wire in the wiring box,
   d. The welder is factory wired for 230 volt, 60 Hz. single phase operation. It may be changed to 208 volt, 60 Hz. operation by changing the wire connections at the terminal block, in the welder. Instructions for this connection are adjacent to the terminal block inside the case.

Operation

WARNING: NEVER, UNDER ANY CIRCUMSTANCES, OPERATE THE WELDING MACHINE WITH ENCLOSURE REMOVED. IN ADDITION TO THE SAFETY HAZARD, IMPROPER COOLING MY RESULT IN DAMAGE TO THE WELDING TRANSFORMER AND WELDING MACHINE COMPONENTS. READ ALL GENERAL SAFETY INFORMATION CAREFULLY BEFORE OPERATING THE WELDING MACHINE. BE SURE YOU ARE WEARING PROTECTIVE CLOTHING AND PROPER EYE PROTECTION.

1. The rated Duty Cycle of a welding machine is the percentage of a ten (10) minutes period that a welding machine can safely operate at a given output current setting.

DUTY CYCLE CHART



EXAMPLE: if a welding machine is rated 20% duty cycle at 250 AMPS, this means the welding machine can be safely operated 2 minutes out of 10 when set at 250 AMPS. With the Dayton welder, when the welding current is decreased, the duty cycle will increase. The chart enables the operator to determine the safe output of the welding machine at various duty cycles.

2. If you are welding with AC position of machine, insert electrode plug into AC female jack marked "Electrode" and insert ground plug into female jack marked "Ground".
3. To weld DC straight polarity: insert electrode plug into negative (-) DC female jack, and insert ground clamp plug into positive (+) female jack.
4. To weld DC reverse polarity: insert electrode plug into positive (+) female jack and insert ground clamp plug into negative (-) female jack.
5. A slight twist while inserting each plug into the jack will insure a tight connection.
6. Set amperage control as follows:
   a. Lift locking lever up to "Release" position.
   b. Set amperage to desired amp setting by moving pointer to desired amp output.
   c. Push locking lever down to "Lock" position.
7. Flip the power switch to the ON position.

Operation (Continued)

8. Be sure to have proper eye protection before striking arc.
9. Place an electrode of proper type and size into the electrode holder and start welding.
10. Stop welding and adjust the current control if necessary.
11. After the welding job is completed, break the arc and flip the power switch to the OFF position.

CAUTION: Never attempt to strike an arc with the locking lever in the "Release Position". This can cause the amp selector to jump, which could damage internal parts.

12. If an extension cord, longer supply wires, or longer output cables are to be added, lengths and sizes should be within limits shown below:

WIRES	INPUT WIRES* (EXTENSION CORD OR SUPPLY WIRES)	OUPUT CABLES **
MAX. LENGTH	100 FT.	100 FT
MIN. SIZE	No. 8 AWG, 3-Conductor	No. 2 AWG

(*) For maximum of 10% drop in input to welder.
(**) For maximum of 7% drop in output power from welder.

CAUTION: The above table applies only to these welding machines, and allows for specific duty cycles at higher output currents. Do not use this table as a guide for other products since extension cords could be overloaded.

Maintenance

WARNING: BE SURE THE BRANCH CIRCUIT MAIN DISCONNECT SWITCH, OR CIRCUIT FUSES ARE REMOVED BEFORE ATTEMPTING TO INSPECT, OR WORK INSIDE OF THE WELDING MACHINE. PLACING THE POWER SWITCH IN THE OFF POSITION DOES NOT REMOVE VOLTAGE FROM THE POWER SWITCH TERMINALS INSIDE THE WELDING MACHINE.

TRANSFORMER

Occasionally blowing out the dust and dirt from around the transformer is recommended. This should be done periodically depending upon the location of the welder and the amount of dust and dirt in the atmosphere. A clean dry air stream should be used for this cleaning operation.

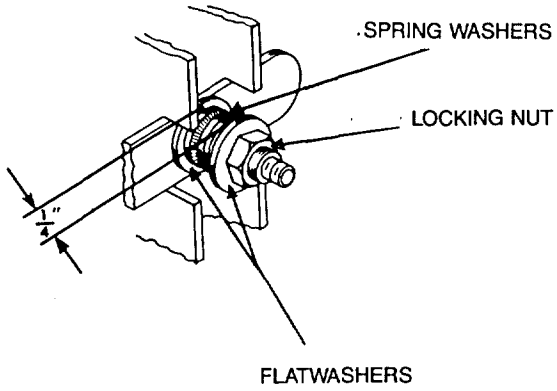


Figure 5 - Shunt Locking System

SHUNT LOCKING SYSTEM ADJUSTMENT

Adjustment of this pressure is done by tightening the locking nut until the spring washers are partially compressed (see Figure 5). This adjustment is made at the factory when the unit is built; however, it may be necessary to readjust the tension after hours of use. If the amperage control slips or moves when you weld, the tension should be readjusted.

Adjust shunt lock system as follows.
See Figure 5 for reference.

1. Unscrew the enclosure screws and remove enclosure from welder.
2. Lock and unlock the shunt a few times to familiarize yourself with the mechanism and pressure required.
3. Turn locking nut one-sixth (1/6) of a turn clockwise. (The six flats of the nut should be used to tell how far to rotate.)
4. Lock and unlock the shunt and note that the pressure has increased. If not, tighten the nut another one-sixth of a turn and check again.
5. Replace enclosure and screws.

CAUTION: Do not overtighten locking nut. Spring washers should NOT be completely compressed. When shunt is locked there should be 1/4" space between the insides of the flatwashers for proper adjustment. Too much tension can cause damage to the clamping parts.

Troubleshooting Chart

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Welder output too low.	Input line not in proper capacity.	Have an electrician check to see if line is 220-230 or 208 volt, single phase, and that the wiring is delivering the rated power.
Welder causing shock.	Welder wired with a "hot" wire to the "ground" terminal.	Disconnect the welder, then check "Ground" connection of welder receptacle. DO NOT USE WELDER UNTIL CAUSE OF SHOCK HAS BEEN DETERMINED AND CORRECTED.
Trickle shocks.	Moist ground.	Stand on dry board or other dry surface.
Welder does not hum when turned ON.	Welder not getting power.	Check fuses and circuit breakers back to meter.
Welder hums but does not weld.	1. Poor connection outside welder. 2. Poor connection inside welder. 3. Wrong electrodes. 4. Defective diode.	1. Disconnect welder, then check cable connections. 2. Disconnect welder, then check connections and leads inside the welder. All connections should be tight. 3. Check to be sure proper electrodes are being used. 4. Consult dealer.
Amperage control slips or moves when you start to weld.	1. Shunt locking. 2. System locking. 3. Nut loose.	Tighten (See Maintenance under SHUNT LOCKING SYSTEM ADJUSTMENT).

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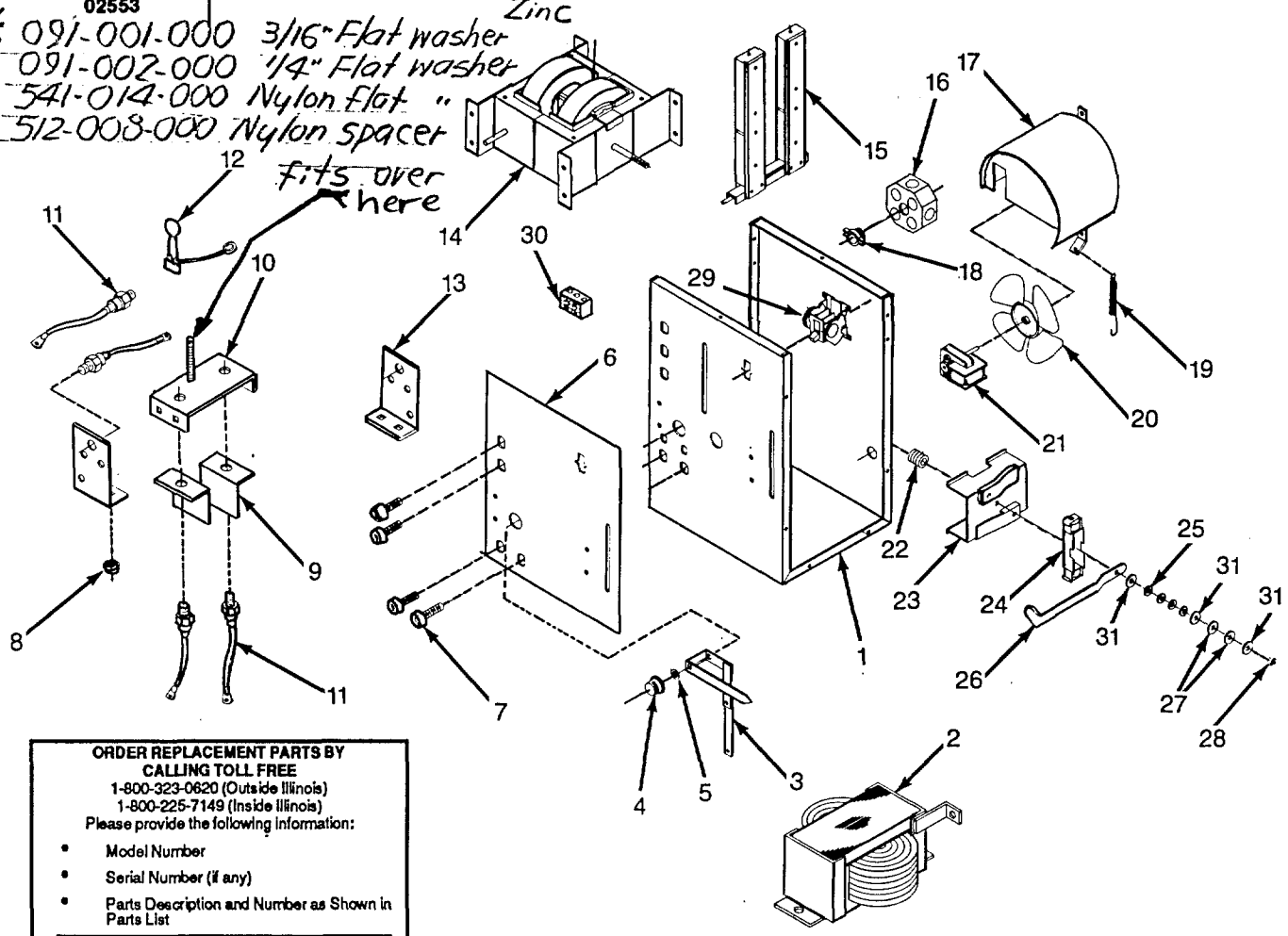
* 091-001-000 3/16" Flat washer Zinc
091-002-000 1/4" Flat washer
541-014-000 Nylon flat "
512-008-000 Nylon spacer fits over here



ORDER REPLACEMENT PARTS BY CALLING TOLL FREE
1-800-323-0620 (Outside Illinois)
1-800-225-7149 (Inside Illinois)
Please provide the following information:

- Model Number
- Serial Number (if any)
- Parts Description and Number as Shown in Parts List

Address parts correspondence to:
Dayton Electric Mfg. Co.
1250 Busch Parkway
Buffalo Grove, IL 60089

Figure 6 - Replacement Parts Illustration

Replacement Parts List

REF. NO.	DESCRIPTION	PART NO.	QTY.
1	Base wrapper	410-197-100	1
2	Reactor assembly	860-265-888	1
3	Dial linkage	860-124-100	1
4	Linkage hub	541-048-000	1
5	Push nut	068-011-000	1
6	Dial plate	711-166-020	1
7	Jack receptacle	312-028-666	4
8	Insulator spacer	512-010-000	8
9	Heat sink fin	412-107-000	2
10	Heat sink, channel	412-103-000	1
11	Diode, silicone	214-004-666	4
12	Transient, voltage protector	860-189-666	1
13	Heat sink, angle	412-104-000	2
14	Transformer assembly	860-263-888	1
15	Shunt assembly	860-121-000	1
16	Conduit box	239-073-000	1
17	Fan baffle and bracket	860-117-000	1
18	Box connector	239-074-000	1
19	Spring	330-016-000	2
20	Fan blade	316-007-666	
21	Fan motor	216-034-100	1
22	Counter spring	310-060-000	1

REF. NO.	DESCRIPTION	PART NO.	QTY.
23	Shunt clamp	860-118-000	1
24	Clamp roller assembly	860-119-000	1
25	Spring washer	330-017-000	4
26	Clamp handle	412-231-010	1
27	Thrust washer	311-085-000	2
28	Locking hex nut	069-010-000	1
29	Switch	216-010-666	1
30	Terminal block	239-057-000	1
31	Flatwasher, 3/8"	*	3
Δ	Case wrapper	410-164-100	1
Δ	Set of two jack plugs	4031	1
Δ	• Ground clamp assembly	4100	1
Δ	• Ground cable, 10 ft.	238-082-000	1
Δ	■ Electrode holder assembly	239-038-100	1
Δ	■ Electrode cable, 12 ft.	238-083-000	1
Δ	† Arc stabilizer	115-007-000	1
Δ*	† Tig torch	115-005-900	1
Δ	Welding helmet with strap	4213	1
Δ	Helmet strap only	332-178-000	1
Δ	† Wheel kit	2Z966	1
Δ	† Power cord	131-060-000	1

(Δ) Not shown.
(†) Optional.
(*) Standard hardware item.
(•) Ground Clamp assy & ground Clamp cable set # 4018
(■) Electrode holder assy & Electrode cable set # 4019

(*) See pgs 7 & 8 for individual TIG TORCH PARTS

Service Record

DATE	MAINTENANCE PERFORMED	REPLACEMENT COMPONENTS REQUIRED

#115-002-000 TIG TORCH FOR 37553 & 37564

Individual Replacement Parts for TIG TORCH

No.	Part Number	Description
1.	334-053-000	Torch with Coupled Hose
2.	332-037-000	Collet 1/16"
	332-038-000	Collet 3/32"
	332-039-000	Collet 1/8"
3.	332-095-000	Adapter
4.	332-094-000	Fibre Insulator
5.	084-008-000	Set Screw #10-24 x 3/16"
6.	332-040-000	Ceramic Cup for 1/8" Collet
	332-041-000	Ceramic Cup for 1/16" or 3/32" Collet
7.	332-114-000	Regulator with Gauges
8.	332-112-000	Flow Meter, 0-40 CFH
9.	332-113-000	Pressure Gauge, 0-3000 PSI

Additional Accessories

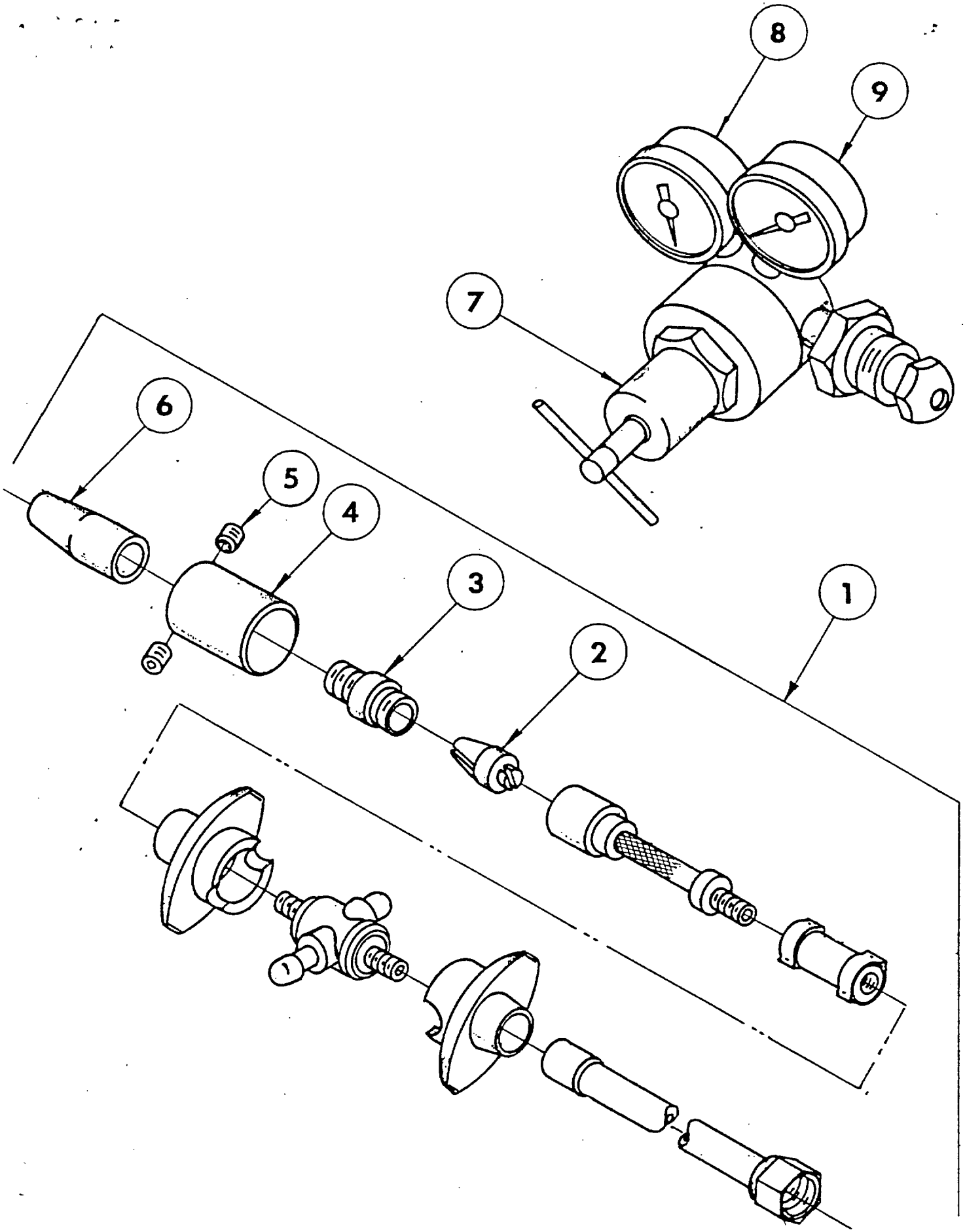
332-042-100	Tungsten 1/16" x 6", 2 per pkg.
332-043-100	Tungsten 3/32" x 6", 2 per pkg.
332-044-100	Tungsten 1/8" x 6", 2 per pkg.
331-400-500	Aluminum Welding Rod, 36"
331-401-500	Aluminum Mag Welding Rod, 36"

131-021-000 Accessory Kit
including:

331-400-101	1 lb. #4043 Aluminum Rod
331-401-101	1 lb. #5356 Aluminum Rod
332-100-000	Stainless Steel Brush
332-038-000	3/32" Collet
332-041-000	Ceramic Cup for 1/16" or 3/32" Collet
332-042-100	Tungsten 1/16" x 6", 2 per pkg.
332-043-100	Tungsten 3/32" x 6", 2 per pkg.

131-056-000 Tig Supply Kit
including:

331-400-101	1 lb. #4043 Aluminum Rod
331-401-101	1 lb. #5356 Aluminum Rod
332-038-000	Collet 3/32"
332-039-000	Collet 1/8"
332-040-000	Ceramic Cup for 1/8" Collet
332-041-000	Ceramic Cup for 1/16" or 3/32" Collet
332-042-100	Tungsten 1/16" x 6", 2 per pkg.
332-043-100	Tungsten 3/32" x 6", 2 per pkg.
332-044-100	Tungsten 1/8" x 6", 2 per pkg.
332-100-000	Stainless Steel Brush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